

Exhibit C

**IN THE UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF WEST VIRGINIA
CLARKSBURG DIVISION**

WESTFIELD INSURANCE COMPANY a/s/o ARCO ENTERPRISES, INC., Plaintiffs, v. BRIDGESTONE AMERICAS TIRE OPERATIONS, LLC Defendant.	Civil Action No. 1:14-cv-00055-IMK
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Gary A. Derian, under penalty of perjury, deposes and says:

1. I am a mechanical engineer with extensive experience in tire engineering, vehicle engineering and vehicle crash reconstruction. I am a registered professional engineer in the states of Ohio and North Carolina. I received a bachelor's degree in Mechanical Engineering from Case Western University in 1974. I am also a registered professional engineer for the State of Ohio, and a member of the Society of Automotive Engineers. I have continued to earn continuing education credits to keep my registration current. A copy of my curriculum vitae detailing my background and experience is attached hereto as **Exhibit "A"**. Each of the statements set forth therein are true and accurate and are within my personal knowledge.

2. I have experience in all phases of tire manufacture. I have experience in the design of high performance passenger and light truck tires for on and off road use, tread design for water drainage, carcass stability construction, wheel interaction to optimize tire performance and wet and dry traction performance. I have developed tire constructions with fail safe characteristics to maintain vehicle control. I have developed passenger tires for endurance racing. I have created mold and bladder designs to improve material flow during the tire curing process to improve tire quality.

3. I have worked very closely with tire compounds, worked with cord groups, tread design, compounds of skim stock, tread compounds and worked closely with people making tire beads during the course of my career.

4. I am fully familiar with all aspects of the tire manufacturing process, including the manufacturing process for building medium truck tires. The technical aspects of “building” a medium truck tire during the manufacturing process is similar to that of the subject tire, an all steel truck tires.

The knowledge, skill, experience, training and education I have gained through my work have qualified me as a tire expert in 35 states. My qualifications apply towards analysis of failed products that are manufactured from plies of cords and rubber. This includes tires of all sizes and shapes as well as other similarly manufactured products such as hydraulic hoses or conveyor belts.

The methodology of tire failure analysis is the same whether the tire is used on a hand truck, garden cart, passenger car, light truck, medium truck, heavy truck, agricultural implement or off road heavy equipment. The reinforcing materials and elastomers are intended to work together as a composite structure in every size and type of tire, as well as other products.

5. I began my career in the tire industry in 1976 at BF Goodrich and worked for this company until 1986. While at BF Goodrich, I held the positions of Product Engineer, Tire Engineer and Product Manager. I worked for six (6) years designing tires. This work involved writing tire specifications and building tires to specifications. This work would include belt and carcass material, and ply widths and angles, skim coat compound characteristics, tread compound characteristics, and bead and lower sidewall features,

6. I also acted as lead design engineer for various speed-rated and non-speed rated tires. I was responsible for performing various tests on the tires I designed, including indoor high-speed tests, indoor road-wheel durability tests, and various on-road vehicle testing.

7. During my twelve year tenure at BF Goodrich, I built some of the tires I designed. Specifically, I spent many weeks each year at BF Goodrich's Tuscaloosa, Alabama and Akron, Ohio plants building tires and other prototypes. As part of my design efforts involving the Comp T/A tire line, I created a unique tire design incorporating fiberglass belts that were folded at their edges and also included nylon cap plies over the top of the folded fiberglass belts. Those designs provided extra protection against belt and tread separation; inhibited tread detachment; and prevented belt detachment as occurred with the failed tire. During my development of the Comp T/A tire, and other tires for BF Goodrich, I built and tested tires both with steel belts, such as the subject tire contained, and fiberglass belts.

8. I was also responsible for monitoring tire field performance, examining tire returns for defects, and inspecting cut-tire sections from the plant for anomalies and defects. Additionally, I trained tire store personnel and field service personnel on how to examine tires.

9. At BF Goodrich, I worked with people who designed truck tires. I analyzed failed truck tires with these people to see how these tires operated and the kind of problems these truck tires might experience. I would use this knowledge to apply to the design and construction of truck tires.

10. I have, along with other tire engineers at BF Goodrich, analyzed returned tires from road wheel tests, field tests and customer returns. Over the past 38 years, I have analyzed thousands of failed tires.

11. While employed at BF Goodrich Company, I would, on occasion, inspect tires involved in lawsuits with other Tire Engineers and would discuss with them issues involving those tires and causes of the tire failure, which would include poor adhesion.

12. Over the years, I have reviewed the results of field monitoring of truck tires while at BF Goodrich Company. I have also reviewed bonding and adhesion testing results for passenger, and truck tires.

13. I have studied tire chemistry ever since I worked for BF Goodrich Company. I have extensive knowledge about polymers and polymer chemistry.

14. I hold two patents for tire designs. I hold three patents for hydraulic systems, flow detecting and dispensing and one patent for hydraulic seal designs.

15. I was a consultant to the Dunlop Tire Company and created a Tire Fitment Guide for passenger and light trucks sold in the United States. This guide was divided into three sections and is intended to serve as a tire retailer/seller's reference book on numerous important issues. The first section of the guide dealt generally with tires, explaining, among other things, proper techniques for mounting, care, balancing, rotating, and calculating speed ratings and load indices. Another section focuses on Dunlop replacement tires, and the specific speed ratings, load indices, and high performance fitments for all rim sizes and car types sold in the United States. The other section provided similar information for all light trucks sold in the United States.

16. From 1990 to 2013, I have worked for Robson Forensic as a Forensic Engineer and have investigated and analyzed hundreds of tires to determine the cause of a tire failure. I have testified numerous times as a Tire Engineer regarding causes of tire defects.

17. I have kept abreast of the tire industry generally, including the design of all types of tire and tire manufacturing processes. I have also kept abreast of the literature in the tire industry.

18. I am fully familiar in analyzing a tire failure to determine if it was caused by a manufacturing defect. I am knowledgeable in the methodology used to help determine what caused a tire to fail, including a medium truck tire. The techniques and methodology used in examining an all steel truck tire are exactly the same as a passenger tire. The rubber tear patterns reveal the same information no matter which type of tire they come from. Poor adhesion and ply separation create the same failure patterns in all tires.

19. I have inspected the subject failed Bridgestone tire.

20. The methodology I used for my tire inspection was a visual and tactile inspection. A visual and tactile inspection of tires is a standard methodology used by all tire experts. A visual and tactile inspection is used on passenger tires, medium truck tires, or any tire. The defendant's tire expert, Joe Grant agrees with this methodology. Defendant's expert, Joe Grant, also used a visual and tactile inspection for his exam of the subject tire. I also took numerous photos of the subject tire and notes.

21. The subject failed tire was a Bridgestone M860, size 315/80R22.5 and was fitted to the left front steer position. I used a moderate power microscopy (six to ten power) as part of my examination of the subject tire.

22. Based upon my visual and tactile inspections of the subject Bridgestone M860 tire I found evidence of poor adhesion between the belt edge cushion gum and the carcass ply. Poor adhesion would only occur during the manufacturing process. When the subject tire left the defendant's factory, it had this poor adhesion defect between the cushion gum for first belt ply

and the tire carcass ply. The poor rubber to rubber bonding between the cushion gum for first belt ply and the tire carcass ply caused the adhesion defect. This adhesion defect was created during the manufacturing process. I took numerous photographs that documented the poor adhesion that I observed on the subject tire. These photos show the original surface of the carcass ply skim stock which is evidence of poor adhesion. This pattern is sometimes referred to as "liner marks".

23. In addition to visual and tactile inspections that I used, I also used as part of my analysis consideration of other known factors that can cause tread separation in a truck tire. This is further discussed in this affidavit.

24. A tire is a rubber/wire composite structure that is manufactured from many layers of materials. The liner ply retains inflation air. The carcass plies withstand the force of the inflation pressure and shape the sides of the tire. The belt forms the foundation for the tread and sets the diameter of the tire. These various plies are squeezed together with high heat and pressure when the tire is cured in its mold. During the curing process, the rubber in the plies of the tire becomes vulcanized and the molecules interdiffuse across the interface as they intertwine and crosslink to form a continuous layer of rubber.

25. In a well-bonded tire, these rubber layers become a single layer in which the original surfaces disappear. This bonding is essential to the integrity of a tire. Without the rubber, a tire would be merely a tangled mass of bits of wire. The rubber holds the layers of wire together, keeps the strands of wire parallel, and transfers the stresses from one layer of wire to another so the layers act as a structure. The Bridgestone M860 has 5 layers of wires under the tread area. These are 4 belt plies and one carcass ply. All these 5 layers must work together in order for the tire to function.

26. When the layers are poorly adhered and separate, the plies delaminate, the tire fails, and the driver often loses control of the vehicle.

27. It is common knowledge in the tire industry that poor adhesion is the direct result of poor quality control occurring during the manufacturing process within a tire factory.

28. The various components of a tire are prepared in different parts of a tire plant. The materials are coated with uncured rubber that is tacky to the touch like a pressure sensitive adhesive. These materials are then transported to the tire assembly machine. Because the tire components are tacky, they cannot be allowed to touch each other before being assembled into a tire. To prevent this touching, the components are typically rolled up with a liner material or separated on trays. This separation prevents the rubber pieces from sticking together until the tire is assembled. It is important to keep the separated objects clean to prevent contamination of the tire components. It is also important to manage the inventory of tire components to keep them fresh. Old or contaminated tire components lose their tackiness and do not hold together well when the tire is assembled. Any of these conditions will cause poor adhesion between the components and result in an internal separation in the tire during its service.

29. In a properly cured tire, it is very difficult to separate the various layers of steel belt plies along their original surfaces. The layers must work together as a single unit, a rubber/wire composite structure, in order for the tire to perform as designed. The layers of a tire, when cured, form a continuous stratum of rubber that gives a tire its strength. These layers cannot be separated without tearing the rubber apart. This tearing action leaves distinct marks on the rubber layers. If the individual layers were old, contaminated, were never pressed together or otherwise had poor adhesion, they would separate along their original surface and leave no

distinct tear marks. This is the condition found between the carcass skim stock and the beld edge cushion gum in the detached area of the subject right front tire.

30. The belts in this tire were not properly cured and adhered together. This built-in weakness is a manufacturing defect that is a substantial cause of tire failure. Any separation in a tire creates a stress and strain concentration at its edges. These stress and strain concentrations cause the rubber layers to fatigue. As the rubber fatigues, the area of separation enlarges, eventually growing to the point where the tire's tread and belts can no longer remain attached. The resulting detachment is known to cause the driver to lose control of the vehicle.

Truck Tire Life

31. Truck tires are traditionally retreaded. Therefore a tire's structure, the 5 layers of wire and rubber under the tread, must be designed and manufactured to last through multiple treads. The subject tire was projected to last more than 140,000 miles before it wore out and required a retread. It would reasonably be expected to last through two retreads for a total mileage of more than 400,000.

32. The subject tire failed at approximately 65,000 miles, a small fraction of its expected life. Tires that fail in such short use are often found to be defective.

33. There are several known conditions that can cause tire failure in the absence of a defect in the tire. The consideration of these causes is part of the methodology followed by the tire experts, generally whether the tire is examined in litigation context or not. These causes generally are road hazard or impact, chemical attack, damage to the tire over age, excessive wear, high speed operation in excess of tire rating, overdeflection due to either overloading or under inflation, misuse or abuse. All of these causes can be ruled out in the case of this tire

failure. In addition to elimination of external causes, inspection of the subject tire reveals an adhesion defect in the plies that led to its failure.

Road Hazard

34. The driver, Herbert Pfeifer, testified that he did not hear, see, feel the truck strike any road hazards on the day of the accident. Moreover, Mr. Pfeifer testified that the subject truck was not use on gravel or dirt roads.

35. A road hazard leaves a characteristic X shaped break in multiple belt plies on a tire. Tire condition manuals such as the Radial Tire Conditions Manual published by the Tire Industry Association and used by tire dealers describe road hazard caused failures as localized rupture. The plies usually remain tightly bonded. The belts in the subject tire showed no such pattern. The broken wires that did exist in the belt plies are consistent with detached tread pieces becoming folded over and driven on.

Age

36. According to Bridgestone, the subject tire was manufactured during the 27th week of 2008. The failure occurred on February 24, 2012. Tire life is determined by tread wear and age. When either limit is reached, the tire should be discarded and replaced. The age limit of a tire is 6 to 10 years. Three years is a short time in the life expectancy of a truck tire, so there is no issue regarding tire age.

Speed

37. According to the current Bridgestone web site, the subject Bridgestone tire is rate for 65 mph. The tire is not marked with this rating. Unmarked medium truck tires have an understood speed rating of 75 mph. Mr. Pfeifer, the driver, testified he set the truck's cruise control at the posted speed limit, which was 70 mph.

38. A tread-belt detachment caused by excessive high speed would result in a detachment of the complete tread/belt assembly, not a section of the tread as occurred in this failure. Thus, the speed of the truck was not causative of the tire detachment.

Wear

39. A new Bridgestone M860 tire has a tread depth of 24/32 inch. The failed tire measured 15/32 of an inch. Considering 4/32 is the minimum usable tread depth the tire was not worn out.

Overloading and Underinflation

40. The wear pattern of this tire is smooth and regular and shows no signs of underinflated or overdeflected operation. There is always some deflection of a tire to form the footprint on the pavement. This deflection causes the sidewalls to bulge out and the tire bead to rock back and forth against the wheel flange. It is normal for this rocking to create a wear groove in the tire near the rim flange, known as bead grooves. A tire that is regularly driven in an overdeflected state generally develops deeper grooves than a tire that is normally deflected. Large and wide bead grooves can be an indication of overdeflection. The subject tire had no visible bead grooves. This lack of bead grooving indicates the tire was not operated in an overdeflected condition.

41. The even wear pattern, with a slightly greater degree of wear towards the outer grooves is not an indication of overdeflection. Wide tires such as this undergo a significant amount of scrubbing during turns. Wheel camber and toe can affect wear as well. Thus, there is no physical evidence to indicate that it was underinflated or overloaded.

42. According to Mr. Pfeifer, the truck was always lightly loaded, similar to the light load of 7800 lbs being carried on the day of the crash.

Inflation

43. Mr. Pfeifer checked the inflation of the front tires with a pressure gauge before every trip. His tire checking was sufficient to detect a leaky rear tire that was repaired. The evidence indicates the front tires were always properly inflated, and under-inflation can be ruled out as a potential cause.

44. Looking at Exhibit 8 from my deposition, the photograph shows the type of pattern marks that shows poor adhesion. This photograph shows the original manufactured surface of the carcass ply. When the rubber layers are properly bonded the molecules of rubber intertwine and crosslink to create a single layer which cannot be separated at the original interface. If the tire plies delaminate, and carcass ply is relative smooth, the plies were never properly bonded and therefore, the tire exhibits poor adhesion. This poor adhesion can only occurred during the manufacturing process.

45. Exhibit 8 from my deposition is a photograph that also shows evidence of poor adhesion in the circled area of photograph. In this area the tear surface is on the original manufactured surface of the ply.

46. The basis for the poor adhesion is when compounds are touched together, the green tack features of those compounds that cause green tack are actually the molecules that migrate and intertwine and that original surface disappears.

47. In Chapter 5 of Rubber to Rubber Bonding, an article I relied upon and discussed in my deposition, R. Joseph describes how the molecules of rubber migrate and physically intertwine when the layers of rubber are brought into contact with each other. This physical migration would therefore cause the original surface and any patterns in that surface to completely disappear once the rubber layers are pressed together then cured with heat and pressure.

48. In The failure Analyst and Rubber Product Surfaces by Ronald W. Smith, another article I rely upon in forming my opinions in this matter, the author states that visual inspection of the torn rubber surfaces in a tire provide valuable information regarding how the tire failed. Mr. Smith states that the use of microscopy with a power of 10, which is what I used here, is useful in analyzing tear patterns in rubber surfaces to determine the cause of failure.

49. Smith states that the examiner should compare differing surface topography on the failed tire when analyzing a tire failure. Following Smith's advice, I compared the normal tear patterns visible in the subject tire to the abnormal tear patterns. The abnormal tear patterns are remarkable because of there are relatively smooth. As Joseph's research establishes, properly bonded plies of a tire will not leave a smooth surface. Therefore, through this comparison of all the surfaces on the subject tire, in accordance with Smith, I determined the first tire ply and the carcass ply were never properly bonded.

50. Moreover, while I was employed at BF Goodrich, we did ply pull testing to test the adhesion strength of tire plies. If the plies separated at their original surfaces, we would consider that to be poor adhesion.

51. As I previously stated, the poor adhesion in the subject tire was caused during the manufacturing process of this tire. Any and all causes of the poor adhesion were in the control of Bridgestone. Conditions during the manufacturing process that caused this poor adhesion could have been contamination from dirt, grease, oil, mold release compound, contamination from the rolls of the fabric or polyethylene that was used to separate the components for transportation to the building machine, excess chemicals, excess solvents used to wash away a sulphur bloom on an old fabric, not given time to fully evaporate and dissipate, trapped air in the tire from an incorrect stitching process and porosity would have caused this defect.

52. In this subject tire when four belts are placed on top of each other during the building process there was not a complete bond between these components. More likely than not, these belts could have been touching each other with some foreign material in between that caused this incomplete, poor bond. This caused poor adhesion that caused the tire to fail.

53. Unfortunately, because of the poor condition of the tire after the fire, I cannot say specifically which one of the above conditions caused the poor adhesion. However, the evidence from my investigation supports that the poor adhesion found in the subject tire occurred during the manufacturing process caused by one of the above conditions.

54. In addition to the articles by Messrs Joseph and Smith cited above, I rely upon an article by Bob Kadunce, Clues To Failure Mechanism. This article holds that tear patterns in separated rubber layers is important to analyze.

55. As set forth in my engineer report of the subject tire failure dated October 16, 2014 under Findings, it is my professional opinion, expressed with a reasonable degree of engineering certainty, that:

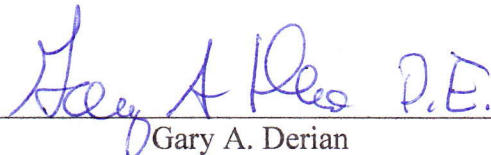
1. There is no evidence of abuse or misuse of the Bridgestone-Firestone M860 tire that failed on the Arco truck driven by Hubert Pfeifer.
2. All potential causes of the tire failure other than a manufacturing defect have been ruled out.
3. The rear patterns visible between the first belt ply and the tire carcass ply indicate a defective rubber to rubber bond in the tire.
4. This defect was created during the tire's manufacturing and existed when it left the plant.
5. This defect caused the thread and belts to separate and detach from the right front tire on the Arco truck and caused it to crash.

56. Attached hereto as **Exhibit "B"** is my Report dated October 16, 2014 which further sets forth my tire inspections, analysis, and findings.

Dated: December 9, 2014

I, Gary A. Derian, under penalty of perjury, state the contents of this affidavit are true and correct:

By:

 P.E.

Gary A. Derian